

## CLAIMS

Claim 1. A surgical device for performing corneal resectioning permitting creation of a corneal flap having a temporal hinge location comprising;

a positioning ring to position and retain an eye, the positioning ring having an opening for the cornea of the eyeball to protrude therethrough;

a blade assembly including a blade and a guide and a mounting member;  
the mounting member having a forward portion and a rearward portion, the forward portion being configured such that the blade and the guide are on the forward portion and the blade is in substantially fixed relationship to the guide and the cutting edge of the blade is facing toward the rearward portion and the rearward portion of the mounting member is configured to attach to a drive mechanism;

a drive mechanism to drive the blade assembly with respect to the positioning ring to move the blade and the guide from a position away from the drive mechanism outside the positioning ring opening toward the drive mechanism at least partially crossing the opening of the positioning ring.

Claim 2. The surgical device of claim 1 in which the substantially fixed relationship of the guide to the blade is that the guide is disposed in front of and above the blade cutting edge to define a space between the blade cutting edge and the guide in front of and above the blade cutting edge.

Claim 3. The surgical device of claim 1 wherein the blade assembly is removably secured and is readily removable from and replaceable on the drive

mechanism without tools.

Claim 4. The surgical device of claim 2 in which the mounting member comprises spaced apart elements and the guide and the blade are each attached at lateral extremities to the spaced apart elements to define the fixed relationship of the guide to the blade.

Claim 5. The surgical device of claim 2 wherein, at least in the portion of the blade cutting edge that will cut a corneal flap, the guide having a perimeter that at least in a portion thereof extends in a curve upwardly away from the blade cutting edge.

Claim 6. The surgical device of claim 2 in which the guide is formed integrally with the spaced apart elements.

Claim 7. The surgical device of claim 4 in which the blade and the guide extend straight across the space defined by the lateral extremities and the substantially fixed relationship of the guide to the blade is that the guide is disposed in front of and above the blade cutting edge to define a space in front of and above the blade cutting edge and the guide has a perimeter that at least in a portion thereof extends in a curve upwardly away from the blade cutting edge.

Claim 8. The surgical device of claim 5 wherein prior to extending upwardly, the perimeter of the guide extends in a straight portion.

Claim 9. The surgical device of claim 7 wherein prior to extending upwardly, the perimeter of the guide extends in a straight portion

Claim 10. A method for performing corneal resectioning to create a corneal flap having a temporal hinge comprising the steps of;

positioning an eye in a positioning ring having an opening for a cornea of the eyeball to protrude therethrough;

attaching a blade assembly having a blade and a guide and a mounting member to a drive mechanism connected to the positioning ring the mounting member having a forward portion away from the drive member and a rearward portion near the drive member, the forward portion being configured such that the blade and the guide are mounted thereon so that the blade is in substantially fixed relationship to the guide and the cutting edge of the blade is facing toward the rearward portion and the rearward portion of the mounting member is configured to attach to the drive mechanism;

establishing a start position for the cutting procedure in which the blade and the guide are at a position relative to the positioning ring distal from the drive mechanism;

controlling the drive mechanism to drive the blade assembly with respect to the positioning ring toward the drive mechanism at least partially across the positioning ring opening; and

thereby to separate a flap from the corneal tissue protruding through the positioning ring, the flap having a thickness substantially controlled by a spacing and orientation between the blade and the guide, and the flap having a hinge near to the drive mechanism.

Claim 11. The method of claim 10 wherein the blade assembly has been

removed, and including the further steps of securing the blade assembly without tools.

Claim 12. The method of claim 10 including the further step of removably securing the positioning ring without tools.

Claim 13. The method of claim 10 wherein the blade cutting edge is sapphire.

Claim 14. The method of claim 10 in which the blade assembly mounting member comprises spaced apart elements and the guide and the blade are each attached at lateral extremities to the spaced apart elements to define the substantially fixed relationship of the guide to the blade.

Claim 15 The method of claim 14 in which the guide is formed integrally with the spaced apart elements.

Claim 16. A method for performing corneal resectioning to create a corneal flap having a temporal hinge comprising;

providing a surgical device as defined in claim 1;

placing the device for operation with respect to a patient such that the drive mechanism extends temporally from and nasally toward the patient with the forward portion of the mounting member near the patient's nose; and

operating the device to cut a corneal flap beginning near the nasal side of the cornea and stopping at a point near the temporal side of the cornea to leave a corneal flap having a temporal hinge.

Claim 17. A method for performing corneal resectioning to create a corneal flap having a temporal hinge comprising the steps of;

providing a surgical device that can cut a corneal flap that has a drive

mechanism in a portion to be held by an operator and that has a flap cutting apparatus operated by the drive mechanism to drive a flap cutting blade from a starting position away from the drive mechanism toward the drive mechanism;

positioning the surgical device so that the drive mechanism is held by the operator extending relative to the patient from the temporal area toward the nasal area to position the cutting blade near the nasal side of the cornea; and

operating the device to drive the cutting blade through the cornea toward the temporal side to create a flap that has a temporal hinge.